

# **ZTE MC8160 Module Technical Specifications**

**Version: V1.3**

**ZTE CORPORATION**



**This manual is also applicable for MC8160、MC8260、MC4160、MC9160 modules**

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# Foreword

## Summary

The corresponding product to this document are MC8160、MC8260、MC4160、MC9160 modules. This manual takes MC8160 as examples to introduce the appearance, hardware framework, functions, technical specifications and relevant test standard, which is used for supporting design reference to hardware engineers and product designers.

## Object readers

This document is mostly suitable for engineers as below:

- System designers
- Product engineers
- Hardware engineers
- Software engineers
- Test engineers

## Brief

This document contains 5 chapters, as following:

Chapter	Contents
1 Summary	Basic functions and characteristics of MC8160 module product
2 Abbreviation	Abbreviations appeared in this document
3 Appearance and framework	Appearance figure of MC8160 module
4 Functions	Basic functions and interfaces of MC8160 module
5 Technical specifications	Introduce particular technical specifications of MC8160 module

## Modified records

Modified records accumulate update notes every time. The latest document version includes all update contents previously.

### Document version V1.3 (2008-09-26)

This is the forth time to release the version, the update contents include:

Modify technical support telephone number

### Document version V1.2 (2008-05-07)

This is the third time to release the version, the update contents include:

3 Module's dimension

### Document version V1.1 (2008-03-17)

This is the second time to release the version, the update contents include:

Add the introduction content of MC8260、MC4160、MC9160 modules.

**Document version V1.0 (2007-11-22)**

This is the first to formally release the document.

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# 1Summary

ZTE MC8160、MC8260、MC4160、MC9160 modules are the modules based on QUALCOMM 6025 chipset platform, which is developed by ZTE with independence patents. The support functions such as voice, SMS, data service etc. The module can be applied in wireless public phone (FWP/FWT) and low end mobile phone fields based on CDMA technology.

The frequency band of MC8160、MC8260、MC4160、MC9160 modules are shown as below:

Table1-1 The frequency band of modules

Module name	Standard	Frequency(MHz)
MC8160	CDMA 2000 1X	800MHz
MC8260	CDMA 2000 1X	800MHz
MC4160	CDMA 2000 1X	450MHz Block A,B
MC9160	CDMA 2000 1X	1900MHz

# 2Abbreviation

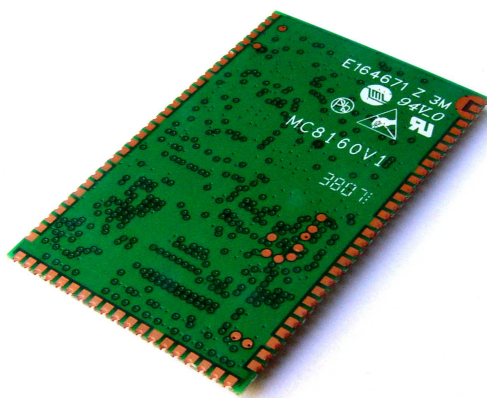
Abbr.	Full name
ADC	Analog-Digital Converter
AFC	Automatic Frequency Control
AGC	Automatic Gain Control
ARFCN	Absolute Radio Frequency Channel Number
ARP	Antenna Reference Point
ASIC	Application Specific Integrated Circuit
BER	Bit Error Rate
BTS	Base Transceiver Station
CDMA	Code Division Multiple Access
CDG	CDMA Development Group
CS	Coding Scheme
CSD	Circuit Switched Data
CPU	Central Processing Unit
DAI	Digital Audio interface
DAC	Digital-to-Analog Converter
DCE	Data Communication Equipment
DSP	Digital Signal Processor
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi-Frequency
DTR	Data Terminal Ready
EFR	Enhanced Full Rate
EGSM	Enhanced GSM
EMC	Electromagnetic Compatibility
EMI	Electro Magnetic Interference
ESD	Electronic Static Discharge

ETS	European Telecommunication Standard
FDMA	Frequency Division Multiple Access
FR	Full Rate
GPRS	General Packet Radio Service
GSM	Global Standard for Mobile Communications
HR	Half Rate
IC	Integrated Circuit
IMEI	International Mobile Equipment Identity
ISO	International Standards Organization
ITU	International Telecommunications Union
LCD	Liquid Crystal Display
LED	Light Emitting Diode
MCU	Machine Control Unit
MMI	Man Machine Interface
MS	Mobile Station
PCB	Printed Circuit Board
PCL	Power Control Level
PCS	Personal Communication System
PDU	Protocol Data Unit
PLL	Phase Locked Loop
PPP	Point-to-point protocol
RAM	Random Access Memory
RF	Radio Frequency
ROM	Read-only Memory
RMS	Root Mean Square
RTC	Real Time Clock
SIM	Subscriber Identification Module
SMS	Short Message Service
SRAM	Static Random Access Memory
TA	Terminal adapter
TDMA	Time Division Multiple Access
TE	Terminal Equipment also referred it as DTE
UART	Universal asynchronous receiver-transmitter
UIM	User Identifier Management
USB	Universal Serial Bus
VSWR	Voltage Standing Wave Ratio
ZTE	ZTE Corporation

### 3Appearance and framework

MC8160 module adopts stamp-hole connection that is 79 pins stamp-hole. Appearance of MC8160 is as following Figure 3-1.

Figure 3-1 Appearance of MC8160 module



- Dimension (length x width x height) : 30.0 mm x 48.0mm x 2.6mm
- Weight: 23g

notes: The pins are distributed at the sides of PCB like stamp, so it's called stamp-hole.

## 4Functions and interfaces

The modules can be applied in wireless public phone(FWP/FWT) and low end mobile phone fields, ZTE can provide entire solutions or software custom according to user's demands of the product functions .

The basic functions and advanced functions of MC8160 module are as following table 4-1 and table 4-2:

Table4-2Basic functions

Item	Description	Remark
Calling	Emergency call	
	Make a call	
	Receive a call	
	Incoming call display	
	Redial	
	Delay number send	
	Hand-free call	
	Silent mode	
	MIC silent mode	
	Incoming call list	10 records
	Outgoing call list	10 records
	Missing call list	10 records
	Call forwarding	Network support required
	Three-way calling	Network support required
	Call waiting	Network support required

Item	Description	Remark
Display	Signal indication	
	Battery state indication	
	Date/time	
	Alarm clock set	
Volume	Ring volume is adjustable	
	Keystroke volume is adjustable	
	Handset volume is adjustable	
Billing	Support 16kHz/12kHz pulse billing	
Data	Support 153.6kbps	
SMS	Sending/receiving SMS	Memory capacity is receiving and releasing 20 SMSs respectively.

Table4-3 Advanced functions

Item	Description	Remark
R-UIM card	Support R-UIM card or not is optional	UIM-card voltage is 3V
Alarm		
Phone book	100 records	

The basic interfaces of MC8160 module is as following table 4-3.

Table4-4 Basic interfaces

interface	description
Audio interface	2 channels
UART interface	1 channel
USB interface	1 channel
LCD interface	Support serial and parallelism
Keyboard interface	4(line)×6(sequence), support ON/OFF
FM interface	1 channel
R-UIM interface	1 channel
RF interface	1 channel
Power supply interface	Support battery charge
Other	ON/OFF detection, exterior power supply insert detection, indicator light, LCD/ Keyboard control in poor light

## 5Technical specifications

### 5.1Communication protocols and technical specifications

The communication protocols and technical specifications of MC8160 module is as following table 5-1:

Table5-5 Communication protocols and technical specifications

<b>Access mode</b>	CDMA (Code-Division-Multiple-Access)
<b>CDMA protocols</b>	IS-95 A/B, IS-98A, IS-126, IS-637A, IS683, IS-707A, IS-2000
<b>Data rate</b>	153.6kbps Max
<b>Frequency interval between Tx and Rx</b>	45MHz for 800M Cellular
<b>Voice encoding</b>	8k EVRC, 13k QCELP

## 5.2RF receiving

RF features of MC8160 module is shown as following table 5-2:

Table5-6 RF receiving

<b>Frequency range</b>	<b>Each frequency band for Rx</b>
Rx sensitivity	-104 dBm(FER≤0.5%)
Rx signal range	-25 dBm~ -104dBm(FER≤0.5%)
Single voice interference immunity	-101dBm(FER≤1%,-30dBm@±900KHz)
Intermodulation spurious response attenuation	-101dBm(FER≤1%,-43dBm@±900 KHz /±1700KHz)
	-90dBm(FER≤1%,-32dBm @±900 KHz /±1700KHz)
	-79dBm(FER≤1%,-21dBm @±900 KHz /±1700KHz)
Conductibility spurious emission	<-76dBm/1MHz (Rx frequency band)
	<-61dBm/1MHz (Tx frequency band)
	<-47dBm/30KHz (other frequency)
Forward traffic channel demodulation under AWGN condition	FER≤3.0% (test 1: data rate 1 (9600bps))
	FER≤1.0% (test2: data rate1 (9600bps))
	FER≤0.5% (test 3: data rate1 (9600bps))
	FER≤1.0% (test4: data rate1 (4800bps))
	FER≤1.0% (test5: data rate1 (2400bps))
	FER≤1.0% (test6: data rate1 (1200bps))
	FER≤3.0% (test7: data rate2 (14400bps))
	FER≤1.0% (test8: data rate2 (14400bps))
	FER≤0.5% (test9: data rate2 (14400bps))
	FER≤1.0% (test10: data rate2 (7200bps))
	FER≤1.0% (test11: data rate2 (3600bps))
	FER≤1.0% (test12: data rate2 (1800bps))

## 5.3RF emission

RF emission features of MC8160 module is shown as following table5-3:

Table5-7 RF emission

<b>Frequency range</b>	824 ~ 849 MHz
<b>Maximum frequency bias</b>	±300Hz
<b>Maximum output</b>	23dBm ~ 30dBm

<b>power</b>	
	<i>Note: MC9160:18dBm ~ 27dBm</i>
<b>Minimum output power</b>	< -50dBm
<b>Standby output power</b>	< -61dBm
<b>Code domain power</b>	Each code domain power on dimmed code channel should be 23dB less than total output power on I,Q channel
<b>Transmitter time error</b>	±1.0μs
<b>Waveform quality factor</b>	>0.944
<b>Open-loop power control</b>	(test 1: -25dBm/1.23MHz) -48±9.5dBm
	(test 2: -60dBm/1.23MHz) -8±9.5dBm
	(test 3: -93.3dBm/1.23MHz) 20±9.5dBm
<b>Closed loop power control</b>	±24dB(9600bps data rate)
	±24dB(4800bps data rate)
	±24dB(2400bps data rate)
	±24dB(1200bps data rate)
<b>Conductibility spurious emission</b>	-42dBc/30KHz or -54dBm/1.23MHz ( Δf : 885KHz~1.98MHz)
	-54dBc/30KHz or -54dBm/1.23MHz ( Δf : 1.98MHz~4.00MHz)
	<-36dBm/1kHz ( Δf  > 4MHz, 9KHz < f < 150KHz,)
	<-36dBm/10kHz ( Δf  > 4MHz, 150kHz<f<30MHz,)
	<-36dBm/100kHz ( Δf  > 4MHz, 30MHz<f<1GHz)
	<-30dBm/1MHz ( Δf  > 4MHz, 1GHz<f<12.75GHz)

## 5.4Recommendation of antenna specs

The recommended antenna specs for MC8160 is as following table 5-4:

Table5-8 Recommended antenna specs

<b>VSWR</b>	1.5:1 maximum
<b>Gain</b>	At least 0 dBi in one direction
<b>Input impedance</b>	50Ω
<b>Polarized form</b>	Vertical polarizing

The requirements for antenna's gain are different in different environment. Commonly, in used frequency range, the larger gain, the better capability; otherwise, out of this range, the smaller gain, the better capability.

## 5.5Input voltage of module

The input voltage is shown in table 5-5:

Table5-9 Input voltage

<b>State</b>	<b>Max. voltage</b>	<b>Typical voltage</b>	<b>Min. voltage</b>
Power supply	4.25 VDC	3.8 VDC	3.3 VDC

## 5.6 Power

The power is shown in table 5-6:

Table5-10 Power

Item	Description
Maximum current	560mA
Call current	230mA
Idle current	5mA

## 5.7 Working conditions

- Working temperature: -10℃ ~ +55℃
- Storage temperature: -20℃ ~ +70℃
- Humidity: 0% ~ 95%